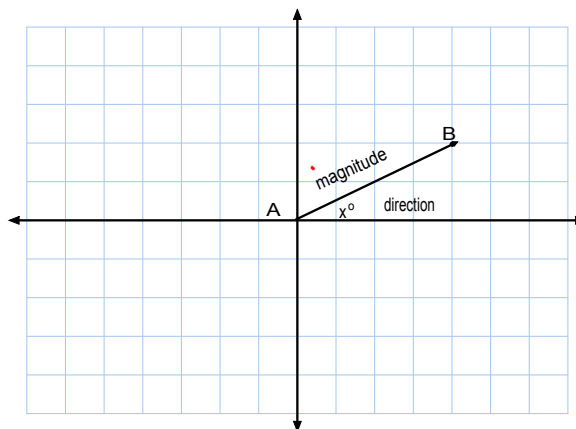


9-6 Vectors

Vector --quantity that has both magnitude, or length, and direction

 \vec{v} \overrightarrow{AB}

A start
B end



Standard position

--initial point at origin

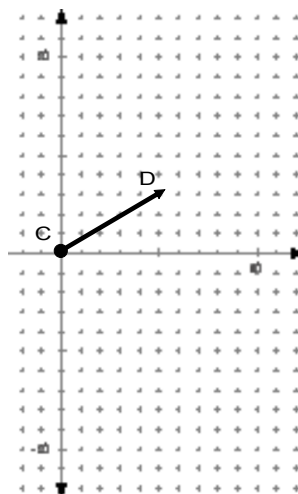
C(0, 0) D(5, 3)

\vec{CD}

Component form

$\langle 5, 3 \rangle$

$\langle x_2 - x_1, y_2 - y_1 \rangle$
 $5-0 \quad 3-0$



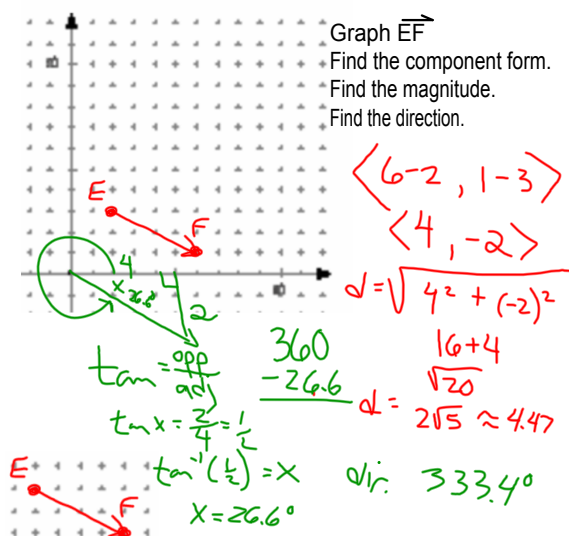
E(2, 3) F(6, 1)

Graph \overrightarrow{EF}

Find the component form.

Find the magnitude.

Find the direction.



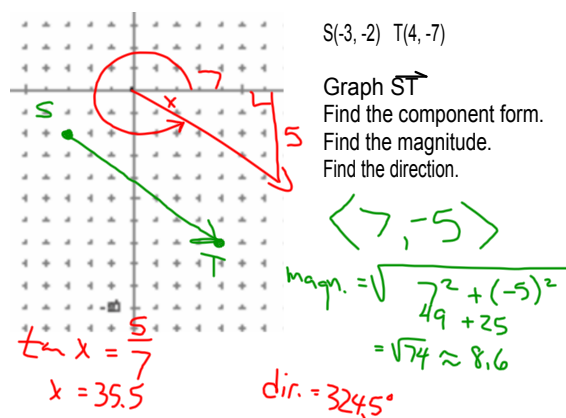
S(-3, -2) T(4, -7)

Graph \overrightarrow{ST}

Find the component form.

Find the magnitude.

Find the direction.

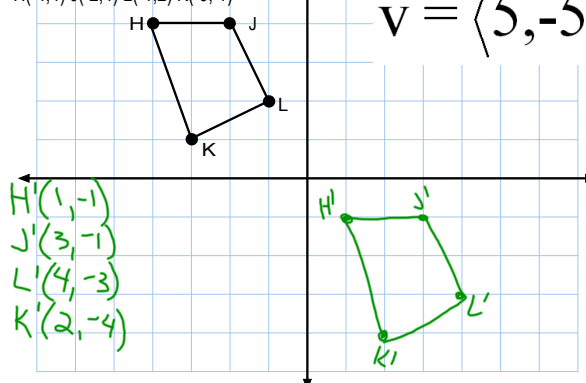


Equal vectors --vectors are equal iff they have the same magnitude and direction.

Parallel vectors --vectors are parallel iff they have the same or opposite direction.

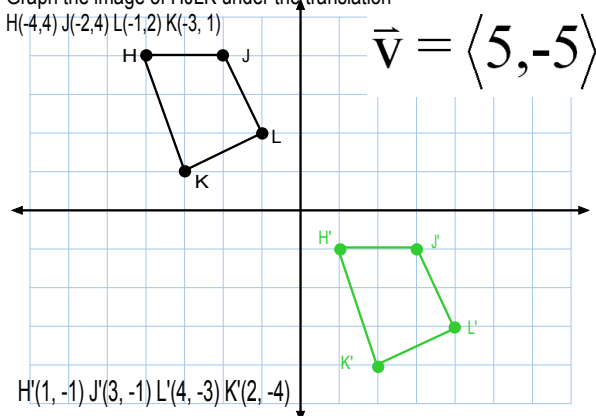
Graph the image of HJLK under the translation

H(-4, 4) J(-2, 4) L(-1, 2) K(-3, 1)

 $\vec{v} = \langle 5, -5 \rangle$ 

Graph the image of HJLK under the translation

H(-4,4) J(-2,4) L(-1,2) K(-3,1)



Translate Triangle EFG under

E(1, -3)

F(3, -1)

G(4, -4)

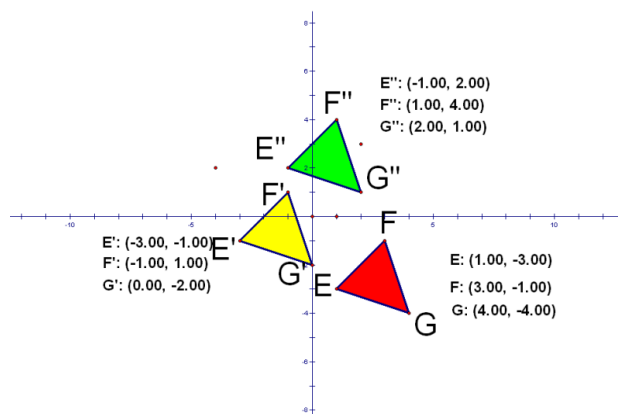
$$\vec{a} = \langle -4, 2 \rangle$$

and then

$$\vec{b} = \langle 2, 3 \rangle$$

$$\begin{matrix} E' \langle -3, -1 \rangle \\ F' \langle -1, 1 \rangle \\ G' \langle 0, -2 \rangle \end{matrix}$$

$$\begin{matrix} E'' \langle -1, 2 \rangle \\ F'' \langle 1, 4 \rangle \\ G'' \langle 2, 1 \rangle \end{matrix}$$



Scalar multiplication
positive scalar (constant)

--multiply a vector by a

If $\vec{a} = \langle a_1, a_2 \rangle$ has a magnitude $|\vec{a}|$ and direction d , then $n \cdot \vec{a} = \langle na_1, na_2 \rangle$

has a magnitude of $|n\vec{a}|$ and a direction of d

HW

p503-504

15-17, 21, 22, 24, 25, 27, 37, 43